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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,693	09/29/2003	Steve Zhihua Zeng	1459-0300620	4166

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LARSON NEWMAN ABEL POLANSKY & WHITE, LLP
5914 WEST COURTYARD DRIVE
SUITE 200
AUSTIN, TX 78730

EXAMINER	
WANG, JIN CHENG	

ART UNIT	PAPER NUMBER
2628	

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/673,693	ZENG, STEVE ZHIHUA	
	Examiner	Art Unit	
	Jin-Cheng Wang	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 10-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 10-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendments

Applicant's submission on 3/3/2006 has been entered. Claims 7-9 have been canceled. Claims 1-6 and 10-18 are pending in the present application.

Response to Arguments

Applicant's arguments filed March 3, 2006 have been fully considered but are not found persuasive in view of the ground(s) of rejection based on Parker et al. US Patent No. 5,528,704 (hereinafter Parker), in view of Greggain et al. U.S. Patent No. 5,594,676 (hereinafter Greggain).

Parker discloses control data (structure) within **a conversion controller** (See Fig. 2) controlling the resolution conversion including the input resolution, the output resolution, and the number of phases or the number of coefficients for the filter in Fig. 2.

The input resolution of Parker meets the claim limitation of "a first variable" because it is more specific to "a first variable". The output resolution of Parker meets the claim limitation of "a second variable" because it is more specific than applicant's claim limitation of "a second variable". The number of phases of Parker in column 8 meets the claim limitation of "a third variable". It is well known that the number of shifts S may be determined from the output resolution M and the number of phases P, e.g., $S = M << P$ and the number of phases may be determined from the output resolution M and the number of shifts $M << S$, as shown in Parker column 8 that the number of phases 9 is determined from the output resolution 400 by right shifting. Therefore, Parker strongly suggests the claim limitation.

Applicant's claim limitation of "a first variable", "a second variable" are broadly construed because the number of input pixels and the number of output pixels set forth in the claim 1 are not variables with respect to a specified image frame. Even assume the first variable and the second variables are "variables" derived from the input resolution and the output resolution, the third variable is not derived from the second variable because the third variable is derived from the output resolution from Paragraph 0018 of applicant's specification. Moreover, as the claim limitations set forth in the claim 1 are broadly construed. First, the three variables set forth in the claim 1 cover all combination of the values. For example, if a number of right shifts as recited take a large number, when applied to the second variable, the third variable becomes a zero value, making the method inoperable. Finally, applicant's claim 1 includes a limitation "when applied to the second variable." However, the third variable is not derived from the second variable, it is derived from a fixed value, i.e., the output resolution.

Because the claim limitations are broadly construed, they are subject to broad reasonable interpretations. See In re Morris, 127 F.3d 1048, 44 USPQ2d 1023 (Fed. Cir. 1997). See MPEP § 2111 - § 2116.01 for case law pertinent to claim analysis.

In view of the Parker's teaching, Parker at least teaches the control data within a controller controlling the resolution conversion and filter construction with the number of the coefficients derived from the output resolution, i.e., 9 phases from the output resolution of 400 (See column 8). **Parker at least discloses the input pixels, the output pixels and the number of phases as controlled by the conversion controller 26 of Fig. 2** and therefore discloses the three variables including the input resolution/input tile size,

output resolution/output tile size and the number of phases. Parker at least suggests the claim limitation of "the three variables" as recited in the claim 1.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to have constructed a control word from the plurality of resolution parameters for determining the output pixel values based on the input and output resolution, phases and registration (column 8).

Although Parker does not expressly disclose, "a third variable indicating a number of right shifts which, when applied to the second variable, indicates a number of phases used in the scaling cycle", however, this claim limitation is related to the selection of the number of phases in an adaptive filtering wherein the adaptive filtering is well known in the art. Moreover, applicant's choice of the number of phases is determined from the number of output pixels, as being right shifted. This determination of the number of phases as recited in the claim 1 covers a broad range of values. Additionally, the number of output pixels and the number of right shift set forth in the claim 1 are generally unknown. However, from applicant's specification, applicant's number of phases is actually a fixed number derived from the output resolution (See Paragraph 0018 of applicant's specification wherein M and L are fixed quantities). Applicant claimed a variable phase derived from the number of output pixels which could be any arbitrary number.

Moreover, Greggain teaches an adaptive filter wherein **the number of phases is determined using the filter lookup table as a function of the output resolution**, i.e., the target increments and thus Greggain teaches an adaptive filtering wherein the number of phases depends upon the output resolution. Greggain mapping the target increment

into a specific filter size or the number of phases (column 2). Greggain's number of upsample increments or the number of phases used in the adaptive filtering is determined using the right shifting the target output resolution parameter such as the target increment and moreover, Greggain's look up table for mapping the output resolution into the number of phases or the filter size may also be determined by the right shifting. Greggain thus expressly discloses "a third variable" from the output of the filter look-up table which maps the filter size to a filter factor and then right-shifts the target increment by this amount to generate the number of phases.

Therefore, having the combined teaching of Parker and Greggain as a whole, one of ordinary skill in the art would have found it obvious to incorporate adaptive filtering of Greggain into Parker's method to construct the number of phases from the output resolution by right shifting the number of output pixels in accordance to the user's defined target increments resulting in correctly Nyquist bandlimited target pixels or lines or frames of the warped images (See column 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6 and 10-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker et al. US Patent No. 5,528,704 (hereinafter Parker), in view of Greggain et al. U.S. Patent No. 5,594,676 (hereinafter Greggain).

Claim 1:

Parker discloses a method comprising:

Determining an input resolution of an image (column 5-7);

Determining an output resolution of an image (column 5-7); and

Providing a plurality of parameter variables in bit word comprising a first variable indicating a number of input pixels in a scaling cycle (i.e., input tile size), and a second variable indicates a number of output pixels in a scaling cycle (i.e., output tile size), and the third variable indicates a number of phases used in the scaling cycle (i.e., the possible phases in column 8).

Parker discloses control data (structure) within **a conversion controller** (See Fig. 2) controlling the resolution conversion including the input resolution, the output resolution, and the number of phases or the number of coefficients for the filter in Fig. 2.

The input resolution of Parker meets the claim limitation of "a first variable" because it is more specific to the claim limitation of "a first variable". The output resolution of Parker meets the claim limitation of "a second variable" because it is more specific than applicant's claim limitation of "a second variable". The number of phases of Parker in column 8 meets the claim limitation of "a third variable". It is well known that the number of shifts S may be determined from the output resolution M and the number of phases P, e.g., $S = M << P$ and the number of phases may be determined from the output resolution M and the number of shifts $M << S$, as shown in Parker column 8 that the number of phases 9 is determined from the output resolution 400 by right shifting. Therefore, Parker strongly suggests the claim limitation.

Applicant's claim limitation of "a first variable", "a second variable" are broadly construed because the number of input pixels and the number of output pixels set forth in the claim 1 are not variables with respect to a specified image frame. Even assume the first variable and the second variables are "variables" derived from the input resolution and the output resolution, the third variable is not derived from the second variable because the third variable is derived from the output resolution from Paragraph 0018 of applicant's specification. Moreover, as the claim limitations set forth in the claim 1 are broadly construed. First, the three variables set forth in the claim 1 cover all combination of the values. For example, if a number of right shifts as recited take a large number, when applied to the second variable, the third variable becomes a zero value, making the method inoperable. Finally, applicant's claim 1 includes a limitation "when applied to the second variable." However, the third variable is not derived from the second variable, it is derived from a fixed value, i.e., the output resolution.

Because the claim limitations are broadly construed, they are subject to broad reasonable interpretations. See In re Morris, 127 F.3d 1048, 44 USPQ2d 1023 (Fed. Cir. 1997). See MPEP § 2111 - § 2116.01 for case law pertinent to claim analysis.

In view of the Parker's teaching, Parker at least teaches the control data within a controller controlling the resolution conversion and filter construction with the number of the coefficients derived from the output resolution, i.e., 9 phases from the output resolution of 400 (See column 8). **Parker at least discloses the input pixels, the output pixels and the number of phases as controlled by the conversion controller 26 of Fig. 2** and therefore discloses the three variables including the input resolution/input tile size,

output resolution/output tile size and the number of phases. Parker at least suggests the claim limitation of "the three variables" as recited in the claim 1.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to have constructed a control word from the plurality of resolution parameters for determining the output pixel values based on the input and output resolution, phases and registration (column 8).

Although Parker does not expressly disclose, "a third variable indicating a number of right shifts which, when applied to the second variable, indicates a number of phases used in the scaling cycle", however, this claim limitation is related to the selection of the number of phases in an adaptive filtering wherein the adaptive filtering is well known in the art. Moreover, applicant's choice of the number of phases is determined from the number of output pixels, as being right shifted. This determination of the number of phases as recited in the claim 1 covers a broad range of values. Additionally, the number of output pixels and the number of right shift set forth in the claim 1 are generally unknown. However, from applicant's specification, applicant's number of phases is actually a fixed number derived from the output resolution (See Paragraph 0018 of applicant's specification wherein M and L are fixed quantities). Applicant claimed a variable phase derived from the number of output pixels which could be any arbitrary number.

Moreover, Greggain teaches an adaptive filter wherein **the number of phases is determined using the filter lookup table as a function of the output resolution**, i.e., the target increments and thus Greggain teaches an adaptive filtering wherein the number of phases depends upon the output resolution. Greggain mapping the target increment

into a specific filter size or the number of phases (column 2). Greggain's number of upsample increments or the number of phases used in the adaptive filtering is determined using the right shifting the target output resolution parameter such as the target increment and moreover, Greggain's look up table for mapping the output resolution into the number of phases or the filter size may also be determined by the right shifting. Greggain thus expressly discloses "a third variable" from the output of the filter look-up table which maps the filter size to a filter factor and then right-shifts the target increment by this amount to generate the number of phases.

Therefore, having the combined teaching of Parker and Greggain as a whole, one of ordinary skill in the art would have found it obvious to incorporate adaptive filtering of Greggain into Parker's method to construct the number of phases from the output resolution by right shifting the number of output pixels in accordance to the user's defined target increments resulting in correctly Nyquist bandlimited target pixels or lines or frames of the warped images (See column 1).

Claim 2:

Parker further discloses the claim limitation of determining a GCD for the input resolution and the output resolution and determining the first variable by dividing the input resolution by the GCD (see column 7, lines 1-15).

Claims 3-4:

Parker further discloses the claim limitation of determining the second variable by dividing the output resolution by the GCD.

Although Parker is silent to the claim limitation of "determining the third variable by right shifting the second variable to obtain a value less than or equal to an available number of phases", Parker discloses the possible phases and the number of phases an input-output grid overlay pattern has depends on the tile sizes determined for the input and output image resolution (column 8). Therefore, Parker at least suggests the claim limitation of "determining the third variable by right shifting the second variable to obtain a value less than or equal to an available number of phases" because the third variable may equal to the number of phases.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to have constructed the number of phases for determining the output pixel values based on the input and output resolution, phases and registration (column 8).

Moreover, Greggain teaches an adaptive filter wherein the number of phases is determined using the filter lookup table as a function of the output resolution, i.e., the target increments and thus Greggain teaches an adaptive filtering wherein the number of phases depends upon the output resolution. Greggain mapping the target increment into a specific filter size or the number of phases (column 2). Greggain's number of upsample increments or the number of phases used in the adaptive filtering is determined using the right shifting the target output resolution parameter such as the target increment and moreover, Greggain's look up table for mapping the output resolution into the number of phases or the filter size may also be determined by the right shifting. Greggain thus expressly discloses "a third variable" from the output of the filter look-up table which

maps the filter size to a filter factor and then right-shifts the target increment by this amount to generate the number of phases.

Therefore, having the combined teaching of Parker and Greggain as a whole, one of ordinary skill in the art would have found it obvious to incorporate adaptive filtering of Greggain into Parker's method to construct the number of phases from the output resolution by right shifting the number of output pixels in accordance to the user's defined target increments resulting in correctly Nyquist bandlimited target pixels or lines or frames of the warped images (See column 1).

Claim 5:

Parker further discloses the claim limitation of determining the input resolution by reading a register value because the input resolution parameters are stored in the register (column 5-8).

Claim 6:

Parker further discloses the claim limitation of the register value representing a number of input pixels in a specific dimension such as the horizontal dimensional (column 5-8).

Claim 10, 16-18:

The claims are subject to the same rationale of rejection set forth in the claim 1.

Claim 11:

Parker further discloses accessing a coefficient set based on the index phase value and determining a scaled pixel value based upon the coefficient set (See column 8).

Claims 12-13:

Parker further discloses accessing the coefficient set by the phase and registration and thereby suggests accessing the coefficient set from a mirror location or accessing the coefficient set from a direction location for determining the output pixel values based on phases and registration.

Claims 14-15:

Parker further discloses bit word within the pixel data or the image data and the bit word incorporating a plurality of resolution parameters, phase parameters and registration parameters.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (571) 272-7665. The examiner can normally be reached on 8:00 - 6:30 (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jcw

Kee M. Tung
Primary Examiner